

LATIN AMERICAN INDIAN LITERATURES JOURNAL

A Review of American Indian Texts and Studies

Vol. 16, No. 2, Fall 2000

TABLE OF CONTENTS

<i>Gabicha: An Unpublished Poem by José María Arguedas</i> by Alita Kelley	Page 99
<i>Aravak Constellations: In Search of the Manioc Stars in Tropical South America. A Bibliographical Survey by</i> Fabiola Jara	114
BOOK REVIEWS	
<i>Lienzos de Tepeticpac</i> by Carmen Aguilera, reviewed by Monica Barnes	150
<i>A Guide to Confession Large and Small in the Mexican Language</i> by Bartolomé de Alva, reviewed by Monica Barnes	152
<i>Unrequited Conquests: Love and Empire in the Colonial Americas</i> by Ronald Green, reviewed by Robert Hauser	155
MEXICAN PICTORIAL MANUSCRIPTS	
<i>Representing and Reinventing Doña Marina: Images from the Florentine Codex and the Lienzo de Tlaxcala</i> by	158

LATIN AMERICAN INDIAN LITERATURES JOURNAL

A Review of American Indian Texts and Studies

EDITORIAL BOARD

Editor: Mary H. Pruss
Book Review Editor: Monica Barnes
Central Mexican Pictorial Manuscripts Editor: Meredith Paxton
Latin American Bibliographer: Eduardo Lozano
Editorial Assistants: Tiana Ambrose, Loydi Espinal

BOARD OF ADVISORS

Ramón Arráspalo Marín, *Universidad Nacional Autónoma de México*
Georges Baudot, *Université de Toulouse-Le Mirail*
Elizabeth Benson, *Institute of Andean Studies (Berkeley)*
William Brito Sansores, *Universidad de Yucatán*
Gordon Brotherston, *University of Essex, University of Indiana*
Domingo Dzul Poot, *Instituto Nacional de Antropología e Historia*
Jill Furst, *Moore College*
Frances Karlunon, *University of Texas, Austin*
Anatilde Idoyaga Molina, *Centro Argentino de Etnología Americana*
Maarten Jansen, *Rijksuniversiteit te Leiden*
Jorge Klor de Alva, *University of Phoenix*
Miguel León-Portilla, *Universidad Nacional Autónoma de México*
Luis Millones, *Universidad Nacional Mayor de San Marcos*
Joel Sherzer, *University of Texas, Austin*
Nancy Troike, *University of Texas, Austin*
Juan Adolfo Vázquez, *University of Pittsburgh*
Johannes Wilbert, *University of California, Los Angeles*

Volume 16 subscription rates (2 issues): Individuals US\$26.00, Institutions US
\$44. Outside of US add US\$6.00 for surface mail and US\$15.00 for airmail.
Make checks payable on a US bank to LAIL. Journal and send to:

Editor, LAIL. Journal
4000 University Drive
Penn State McKeesport
McKeesport, PA 15132-7698

phone: (412) 675-9466; fax: (412) 366-0942
ISSN: 0888-5613

Arawak Constellations: In Search of the Manioc Stars in Tropical South America. A Bibliography Survey

Fabiola Jara

Utrecht University

Introduction

Among linguists there is a broad consensus on the extent to which the Arawak language is distributed throughout South America, from the Maracaibo Gulf on the northwestern coast of Venezuela to the Chaco and from the North Atlantic and Caribbean Coast to the Montaña region of eastern Peru. The classification of these groups into subgroups and branches is, however, subject to discussion. A geographical approach distinguished four main branches: North, North-Amazonian, Pre-Andean, and South. The archaeological data produced by K. Schwering (1972) helps explain most of the differences encountered in historical and ethnohistorical data on Arawak groups presently dispersed over the tropical forest of South America and the Caribbean islands and makes it possible to distinguish three main branches in the ancient history of the Arawak: the Arawak, the Maipuran, and the Tainan. Each of these branches started its migration from a different place and had different destinations. The first branch, the Arawak, started in northwestern Colombia and northern Venezuela and reached the Caribbean Coast, the Venezuelan Llanos, and the Amazon Basin between 3000 B.C. and 2000 B.C.,

bringing with them the first major cultivated crops, the manioc species, as well as other important cultural products: the hammock, pottery for cooking, and the dugout canoe. The Maipuran, the second group, started from the Venezuelan Llanos and reached the Lower Orinoco, the Río Negro, the Ecuadorian and Peruvian Montaña, and the Antilles. between 1000 B.C. to 900 B.C. The Tainan, the third group, began in the Lower Orinoco and headed toward the Antilles and the Middle Orinoco about 1 A.D.

The movements of Arawaks toward the Orinoco and Río Negro could have happened in a cultural vacuum, but we must remember that they came into contact with other cultures from at least 500 B.C., giving rise to the different cultural areas in lowland South America (Schwering 1972). Although they provided the most important elements of the technology in the areas where they came, it seems that the Arawaks acculturated with the other groups to a high degree. On the Caribbean Islands and on the coast of the Guianas they were almost indistinguishable from their Carib neighbors, with whom they share most of their mythology and cosmology. In the Río Negro area they were part of the social trading networks of the surrounding Tukano groups. In the north of Colombia they were integrated as a low caste of servants among the Kogi, and the same seems to be case for the Arawak living among the Mbya Guarani. Moreover, since European contact, the Arawaks seem to compose the most acculturated groups and their fast cultural disintegration rate makes their ethnohistory very poor.

Despite the fragility of the social and symbolic life that seems to characterize the Arawaks, we may expect to find that the astronomical notions connected with horticulture will, at least, remain the same among the Arawaks and that their ideas and technology may even be borrowed by the dominant groups in the areas where the Arawak have immigrated. This hypothesis, discussed throughout the article, is founded on the basic characteristics of the astronomical notions of the contemporary Arawak groups. These characteristics indicate a strong link between the seasonal cycle of manioc horticultural practices and the astronomical notions linked to the movement of a

particular set of constellations, such as the Pleiades, Orion, Scorpius, and Sirius.

This paper is the result of extensive bibliographical research on the ethnohistorical sources dealing with the Arawak-speaking groups of South America. It is intended to provide a catalog of the stars and constellations known to these groups that will serve as a basis for comparative analysis. Some hypotheses will be put forward in the course of the presentation of the data, while those of a more general character will be formulated at the end of the paper. The results remain provisional, until fieldwork is carried out mainly among the Arawak of the Guianas with the purpose of gathering astronomical information.

The best documented Arawak-speaking groups, at least in respect to their astronomical notions and related lore, are those inhabiting the Guiana area, i.e., the Lokono or Arawak proper and the Wapishana and Aorai or Central Arawaks. These groups are rain forest and savana horticulturists. Hunting and fishing are seasonal alternatives to obtain proteins in food, while the gathering of wild fruits and raw materials is an economic activity that takes place the whole year round.

In the region there are two main seasons and two interseasons. The dry season begins around September and lasts until January, followed by a rainy interseason. The rains stop for about two weeks and then from March until mid-June the rains are the heaviest. The rising at sunrise of the Belt of Orion, "the carrier of the sun," announces the coming of the dry season. The agricultural cycle opens with the heliacal rising of the Pleiades, announcing the start of the new year and the time to cut down the first trees.

During the rainy season, ground game is the easiest and preferred food. The dry season is the time for collective fishing, for which poison is used. The nuclear family is the production and consumption unit, based on the following sexual division of labor: men hunt, clear the gardens, prepare wood and vegetable fiber artifacts, build and repair the houses, and prepare the poison for fishing expeditions.

Women plant, take care of the gardens, prepare all the food, gather wild fruits, take part in hunting and fishing expeditions as carriers and cooks, take care of the children, make pottery, and weave cotton.

In the past, the Central Arawak moved their villages every six to eight years, depending on when the soil in the surroundings of the settlement was exhausted or when a headman died. Arawak settlements are now permanent, due mainly to the integration of the Arawak into modern Creole society, the establishment of schools and health posts, the installation of electricity, and the possibility of maintaining a garden far from the village, thanks to outboard motor boats. A settlement in the coastal region now contains 200 to 300 people but in the past would have comprised some 30-60 people. On the coast the longhouses have made way for the nuclear family houses, but the Central Arawak still live in longhouses with the whole settlement under one roof.

In contrast with their Carib neighbors, the Arawak have a complex social structure based on the existence of exogamic clans with patrilineal filiation. The exact meaning of these exogamic units and the way they are incorporated into the overall social structure have been poorly documented and scarcely studied. On the other hand, it seems that the Arawak themselves are much more concerned with the realization of settlement endogamy and cross-cousin marriages than with the clanic structure and arrangements (Overing Kaplan 1984; Rivière 1984; Sanders 1973).

The main sources concerning Arawak star lore are Ahlbrinck (1931), Brett (1868), Goeje (1928, 1939, 1943), Farabee (1918), Koch-Grünberg (1905, 1910), Penard and Penard (1907-1908), Roth (1915, 1924), and Taylor (1946). Most of these sources deal with astronomical data and provide valuable information, but they do not attempt any analysis of it and all lack a systematic ordering of the relevant topics. Furthermore, no attempt has been made to connect these data with other well-known Arawak cultural traits. Most frequently, discussion of Arawak astronomy is limited to assessing the use of certain asterisms to mark the onset or end of seasons; more often than not, treatment of native astronomies does not go beyond

this. In contrast with the studies made among the Carib-speaking and Tukanoan-speaking groups which are both recent and systematic (Butt-Colson and Armellada 1989; Dumont 1976; Hugh-Jones, C. 1979; Hugh-Jones, S. 1979, 1982; Jara 1989, 1990; Jara and Magaña 1983; Magaña 1984a, 1987, 1988, 1989; Magaña and Jara 1982, 1983; Reichel-Dolmatoff 1978, 1979, 1982; Wilbert 1981). The analysis of the astronomical lore of the Arawak lacks, in my view, the required depth as well as a systematic attempt to grasp the astronomical events that native lore explicitly or implicitly describes or explains.

Some preliminary remarks must be made. In gathering the astronomical data of the Arawaks, we have to keep in mind that these peoples have undergone a more severe process of acculturation than any of their Carib and Tukano neighbors. At the end of the nineteenth century a large proportion of the Arawak groups was already considered to be culturally extinct. This sad fact has limited our survey to the examination of vocabularies and lexicographies obtained by ethnographers and linguists working with Arawak informants living in non-Arawak and Creole villages. For detailed information on the precise linguistic affiliation and cultural links of the Arawaks in South America see Chandleess (1869), Gillin (1948), Goeje (1948), Holmer (1949), Mason (1950), Métraux (1948a, b, c, d), Métraux and Steward (1948), Nimuendajú (1948), Noble (1965), Rivet and Reimburg (1921) and Schwerning (1972).

The astronomy of the Arawaks of the Guianas seems to have been the most researched of all the Arawak groups in South America. It also presents a more systemic character and it could be the most Arawakan of all. Still, we cannot discern with precision where in this area Arawak astronomy begins and where exactly Kalina astronomy ends. Kalinas and Arawaks have a long history of contact; and they have been intermarrying, trading, and fighting with each other for a period of at least 1500 years. As is the case with other cultural traits of the Arawak living in the Rio Negro region, the astronomical notions bound to the cosmology of these groups bear much resemblance to those of the Tukano and Desana. A careful study of the resemblances and divergences can bear fruit for the study of the

ethnohistory of these areas and of the strength of the ties between astronomy and economic and technological arrangements (Reichel-Dolmatoff 1989).

In the Montaña area the Arawak-speaking Campa were early occupants; their location there dates back to at least 1200 A.D. (Lathrap in Roe 1982:77). Their astronomy is very different from that of the Arawak groups already listed and it can be expected to be both very archaic and locally influenced. The rest of the Arawak-speaking groups of the Montaña are little-known and the only available sources of information are a few short lexicographies. Not much could be obtained on the Arawaks of the Xingú; this area had been intensively surveyed and studied but information on the astronomies of the various tribes living there is poor.

The cultural dominance of the Tupi-speaking groups in the Xingú can be expected to affect the astronomy as well. The Arawaks inhabiting the Chaco region, the Guana and Tereno, have lived among the Mbya-Guaraní for a long time and they were a kind of a servant caste of the Mbya (Boggiani 1945). The record of their lore and cosmological notions indicates a high degree of acculturation of the Arawaks into the symbolic lives of their masters. The same can be said of the Arawaks living in the north of Venezuela and northeastern Colombia, where these groups have been servants of the Kogi for a very long time. The ethnohistorical sources in both cases are, however, scarce and lack details about the matter that concern us now.

The catalog that follows only includes stars, constellations, and the Milky Way. Planets, sun, moon, and other astronomical objects have been excluded for the lack of space and because the lore connected to them takes us too far into areas connected more with the theme of the origin of culture and the world than with astronomy.

Information has been arranged according to western identification in all cases where there is certainty about the corresponding Arawak stars and constellations. Unidentified Arawak asterisms are listed at the end in their native spelling. The order is to some extent arbitrary. First are listed the constellations that appear to be connected

with the yearly cycle and the onset and end of the seasons, the seasonal cycle connected with the main subsistence activities of horticulture, hunting, and fishing. These are followed by data concerning stars and constellations connected with the onset of a hunting or gathering season of particular species of game and fruits. The list of unidentified constellations is arranged in alphabetical order. Some additional data pertaining to the astronomy of non-Arawak groups have been integrated into the presentation in order to set the data in a comparative perspective within each cultural area.

Stars and Constellations

Pleiades

Arawak is not the only South American language in which *year* and *star* are conveyed by the same word; for example, among the Caribs, *sirijio* means both "star" and "year." The most probable explanation is that the cyclical movement of the stars in these cultures is conceived as the stars' essence. To understand these terms we must consider the following information. If a Carib talks about the bright bodies in the sky, he will call them as a class, *sirijio*; an Arawak calls them *wiwa*. If a Carib is asked for the name of those bodies, his reply will be *sirijio*; an Arawak replies *wiwa*. Pointing to the Pleiades, a Carib will name that specific cluster of stars *Sirijio / Wiwa*. This time the word expresses a singular cluster and not the class. *Sirijio* (the Pleiades) is the star that involves the idea of a star as a being, as can be seen in star lore.

As it is registered in the ethnohistorical and the more recent ethnographical sources in Carib as well as in Arawak, the words *sirijio* and *wiwa* express the concepts of star and year, assuming that they are different referents. However, these sources do not take into account that the relationship between the words and their meanings is historical and contextual or that the translation of the words has imposed distinctions that do not exist in these native societies. The translation of these words as "year" does not refer to the passing of

a unit of linear or cumulative units such as days, months, or years but to the cyclical movement of the stars. *Sirijio* is better described as the ongoing state of the world, a state that goes from one season into the next one. The dynamic of the seasons is cyclical, not linear, and there is nothing cumulative in this progression. The seasons allow the growth of the cultivated plants. The cyclical return of the Pleiades announcing the start of the dry season incorporates the astronomical cycle in the complex of notions involving horticultural practices.

The cycle begins with slashing the forest by the onset of the dry season. Fields are burned at the peak of the dry season and manioc is planted just before the rains begin. The cycle ends with harvesting that continues until the dry season comes again and the cycle starts once more. The heliacal rising of *Sirijio* or *Wiwa* announces the slashing of the fields; its heliacal setting eleven months later announces the harvest of those fields. Thus, the movement of the stars expresses the duration of every single cycle. According to the myth of origin, it is *Sirijio / Wiwa* who initiated agriculture, introducing the manioc and the methods to produce it and, consequently, the cycle connected to it. *Sirijio / Wiwa*'s existence in the heavens keeps this cycle going (Magaña 1988). The nature of the stars lays in their yearly cycle. In other words, the essence of being a star is to be the cycle. It is part of being a star to move in a cyclical fashion and therefore to be the year.

All Arawaks conceptualize the Pleiades as a constellation (Alvarado 1956:289; Goeje 1928:233). In the Guianas they are called *wiwa yoroko*, "star many things" (Goeje 1928:255) or *yokrowiwa* (Penard and Penard 1907, I:103) or just *wiwa*, "year" (Quandt 1807:316). The heliacal rising of the Pleiades marks the beginning of the new year in June and the time for clearing the new planting grounds (Goeje 1943:119). Roth, however, states that it is the rising of the Pleiades at dusk in December that marks the end of the year (1924:715).

The Central Arawaks call them *wiban*, the turtle's nest; their heliacal rising in June announces the onset of the rainy season, *widum* (Farabee 1918:101). In other sources the Pleiades are said to be the

brother of Baukure, corresponding to another constellation formed by the principal stars of Orion. (Wirth 1943:197)

The Ipurina call them *amawa* or *urina* (meaning uncertain) (Nimuendajú 1950-1955). The Palikur and the Marawan call them *tepassiri*, "year" (von Martius 1867:309).

According to Celedón, the Gojjiro call the Pleiades *igua*. *Igua* also is the name of the interseason from March to June, when the rains are intermittent (1878:99). According to Perrin (1989), the raising *jiwa* is associated to the laying of the eggs of the turtles and alligators. This constellation, *igua*, has been identified by Hildebrandt as Ursa Major among the same group (1983:142).

The Baniw (or Baniwa) call the Pleiades *atorarai* or *asuruteri* (meaning uncertain) (Grasserie 1892:19). According to Koch-Grünberg (1906:169, 1910:204), *oxiliperi*, "the youngsters" is the name of the constellation among the Siusi. According to Reichel-Dolmatoff (1989:127), however, the Siusi are a Baniwa *sib* who name themselves after the Pleiades.

The Baré call the Pleiades *ghamepokuly* (meaning uncertain) (von Martius 1867:231).

The Caraiya of Río Negro call them *eamua* (meaning uncertain) (von Martius 1867:232).

Among the Tariana, they represent a girl called *calipeda meenspuin* (Goeje 1943:119).

In Manao the Pleiades are known as *ynana*, "year" (Goeje 1948:164; von Martius 1867:222).

The Passe call them *pulay* (meaning?) (von Martius 1867:255).

The Catoquina of the Jurua River call the Pleiades *tschiriko-hoing*, which is probably a Carib word (*sirika*, "star") (von Martius 1867:162).

In the Chaco the Pleiades are called after the ancestral father by the Guaicuru Mbya group, and this is apparently the case, too, among the Guana and Tereno, who share most of their symbolic and ritual life. The heliacal rising of this asterism marks the start of a long period of ritual ceremonies; the specific Pleiades dance involves a mock fight between women and men in the central square of the village and is followed by a race (Charlevoix 1761, I: 73).

The identification made by Farabee, the Pleiades as a turtle's nest, is easier to associate with the star lore of the zone. Farabee recorded the following myth among the Taruma: a woman was the wife of the turtle. As they were picking the fruits of a tree, the wife was seduced by a fruit-eating bird. The husband realized what was going on and obtained the help of some animals to avenge the offence, but to no avail. The wife was finally eaten up by the jaguar. Two of the woman's eggs, however, were spared and from them arose the turtles known today.

In the Wapisiana version, all the animals participate in eating the turtle woman; her eggs were not eaten. None of the versions ends with the sending of the eggs into the sky. The theme of the unfaithful turtle-wife is known among the Wayana and Tareno, Caribs of the North Amazonian region, who do have a constellation representing a ground turtle; but this does not correspond with the Pleiades (Magaña 1987). Goeje maintains that among the Arawaks "the spirits of animal species that were badly treated on earth (...) ascended to heaven and there they became constellations whence they rule their subjects now" (1943:107). A similar identification has been recorded by Butt-Colson and de Armellada (1989:176) among the Taurepan (or Taulipang Caribs, neighbors of the Wapisiana). The Pleiades represent a turtle *warara* (*Emys amazonica*) and her eggs. Also, an alternative identification of the celestial turtle's nest is to be found among the same Taulipang: this constellation is formed by the bow of Orion, the turtle's shell, and a group of fainter stars near the head of Orion, representing the eggs (Koch-Grünberg 1923:279).

In the Río Negro region the origin of the Pleiades is connected with the motif of the Great Serpent. A woman-water spirit met a

jakami-man (trumpeter bird) and from their union two children were born: a girl (*meenspuin*, "star fire") who became the Pleiades, and a boy, *pinon*, who became the constellation of the Great Snake. From that time on, while the Pleiades disappear in May for one month, the one who went after her, her brother, is renewed (Goeje 1943:119). The anaconda corresponds to Ophiuchus among the tribes of the Rio Negro (Goeje 1943:119). This constellation and the Pleiades display opposite behavior: while the Pleiades are setting, Ophiuchus is rising. The period of one month between the setting and the heliacal rising of the Pleiades at dawn is associated with the time of renewal of the plants and the molting of birds. The end of the year is marked by the setting of the star girl and the simultaneous rising of the Anaconda boy. This opens up a period of decay in which the birds lose their old feathers and the gardens yield their last fruits. The cycle starts again when the Pleiades, star fire, rise and the people begin to cut down the new gardens in June. The name of the Pleiades can easily be associated with the burning of the new gardens, the controlled, i.e., cultural fire that makes horticulture possible. The opposite asterism, Ophiuchus, a mythical snake, seems to carry its meaning firstly in itself, in that being a snake it is renewed naturally by changing its skin, and secondly, in that the time of its rising at the end of the rainy season is the time of uncontrollable floods of water that make horticulture possible by a natural process, the sedimentation of the soil. The use of alluvial deposits by the Arawak horticulturists of the Orinoco and its affluents and of the Rio Negro, seems to date from about 1000-900 B.C., the time of the Maipuran migration (Schwering 1972:53).

The fact that the Siusi call themselves after the Pleiades requires some further comment. The Siusi also give the name of constellations to some of their neighbors with whom the Siusi maintain a complex economic and social trade. Oaliperi are the Pleiades-people; the Dsuiminamei, the jaguar people, a constellation formed by the principal stars of Cetus; the Mauaieuni, the snake people, a constellation formed by the stars of Scorpio; and the Adsaneni, the Armadillo people, a constellation corresponding to Corona Borealis (Koch-Grünberg 1906:168-169). The data are too meager to allow a real analysis, but putting the bits together we could elaborate further. First, we can turn to the relationship established between the names

of the things and the things themselves. According to Im Thurn, a prevalent idea among the Arawak is that the clan's names state a fundamental and intrinsic relationship between the group and the animal or object from which they borrow their name (1883:184). In the present case we are dealing with the name of a local group, but it does not seem far-fetched to suppose that the Siusi establish the same kind of relationship between themselves and the Pleiades. This alone could mean an analogy, but in which field? In his study of the Desana, a Tukanoan group with whom the Arawak are involved in a series of social and economic exchanges, Reichel-Dolmatoff (1982, 1989) has reported the use of constellations to give expression to the cosmological relationships of the Desana with their historical-mythic landscape. They set up a hexagonal figure with the Belt of Orion at the center, the middle star is the center of the world and coincides with the position of one of the exogamic clans known to the Desana.

The Siusi may be using the same type of symbolism. Though their starting point is the local groups and not the exogamic clans, they apply names of constellations to Tukano as well as Arawak-speaking groups. Nevertheless, the Pleiades do not lend themselves so well as the Belt of Orion to establish a central position for the Siusi. The relationships established between the named groups and those between the constellations could be expected to be analogical. One important fact is that the Pleiades are associated first with the beginning of the yearly cycle and second with horticulture. Another problem in studying the available data is that we have only a short list of identified constellations among the Siusi, and we cannot expect that this list is complete. Still we can see that the constellations represent on the one hand significant mythic characters: the Boa, the Jaguar and the Armadillo. On the other hand the Boa, identified as Scorpius, has a peculiar relationship with the Pleiades as their heliacal setting and rising at the opposite hours of dawn and dusk and in both solstitial zones could be used by the Siusi to represent both opposite and complementary relationships in social exchange, such as the exchange of sisters among many patrilineal groups' marriage customs. This kind of analogy is indeed observed and extensively used among the Guiana tribes (Magata 1984a, 1988). The problems encountered in analysis show how much a systematic study of

astronomy is needed to come closer to the principles that underlay their social life.

Orion

In the Guianas, Orion represents *mabukule* or *mabekele*, the man or hunter with the severed leg. According to the most widespread version of its origin, a woman went up into the sky with her lover, a tapir, and was followed by her husband. In the night sky the Pleiades are the woman; the Hyades, the tapir; and Orion, the husband (Goeje 1928:199; Penard and Penard 1907, I:105; 1908, II:57). In another, less complete version, the one-legged hunter is associated with one of the mythic twins. His name used to be *Meconaura* or *Kurrukuruman* and he had two wives (Venus as morning and evening star or, according to Goeje, Jupiter?) (Goeje 1928:199).

Among the Wapisiana this constellation is called Baukur, the furious warrior. Its myth of origin recorded by Farabee is fragmentary and not very explicit in all the details. Baukur was sent up into the sky by the sun or by the god Tumicar because he had killed his son. Tumicar's son seems to have become the Hyades (the tapir's jaw). In another passage of this version it is said that Baukur had also killed and roasted his own wife; he had taken along with him to the sky the wooden rack upon which he had roasted her. A fight that ensued between Tumicar and Baukur at the end of the rainy season accounts for the fact that Orion disappears when the rains stop. This must happen in June when Orion sets heliacally at sunset, and the rains begin to diminish, giving way to the long dry season. Baukur is said to be still angry with the people and he is incessantly throwing arrows upon the earth from the sky in the form of lightning and meteors (Farabee 1918:102-103, 107). In the neighboring highlands of Venezuela, the Kapon and Pemón, both Carib-speaking groups, discern a large constellation including the Pleiades, the Hyades, and Orion's Belt which represents an old powerful shaman and master of the rains, Tamókan (Butt-Colson and Armellada 1989).

Again, in the Guiana area the constellation of the one-legged hunter is associated with the constellation of the tapir (the seducer of

his wife and Orion's prey), but these motifs can be found practically all over South America (Levi-Strauss 1964:205 ff.). This cycle, however, seems to be, from an astronomical reading, more coherent in the Guiana area.

Orion's Belt is also given the name of Katalukuya, the "sea turtle spirit" (Goeje 1928:255). Its heliacal rising at sunrise marks the nestling time species along the beach sandbanks (Goeje 1928:255).

The Palikur call this constellation *mahori* (von Martius 1867:324). This may be the name of one of the fathers of the rains (Lévi-Strauss 1964:236). Pasaninjama is the name given by the Gojiro to the Belt of Orion (Celedón 1878:159); it means "the center of the world" (Hildebrandt 1963:229, 271, 257). Reichel-Dolmatoff has established that the astronomical system of the Kogi of the Sierra Nevada de Santa Marta is based upon the zenithal/overhead observation of stars and constellations; as a starting point in their astronomy the Kogi use counting the zenithal passage at sunset of Orion, referred to by them as "the unique one" or the "central one" (1982:177). This notion also seems to prevail among the Gojiro and Cosina (Celedón 1878:23). Patinajana is another name given by the Gojiro to Orion's Belt. It represents a man with a missing arm (Perrin 1989).

Among the Siusi of Rio Negro, Orion is said to represent a fish-trap, *upitsi*. The association of Orion with the fishing season is shared by their Tukano neighbors (Koch-Grünberg 1910:203).

The pre-Andean Campa call Porinkari the Belt of Orion. Porinkari is the brother-in-law of the Pleiades, Masinkiti, the hero who first used the *ayaguskaka*, a hallucinogen used to communicate with the spirit helpers of the shamans (Weiss 1975:269-270).

Other Arawak groups conceptualize Orion or parts of it, but the meaning is uncertain: *axone-otssanne* among the Baniwa (Grasserie 1892:199), *ghasoi-hyaty* among the Bare (von Martius 1867:232), *mauakey* among the Cariay of Rio Negro (von Martius 1867:232), *turpu ahna* among the Passe (von Martius 1867:255), *piripiri*, a boy, among the Manaó (Balduş 1958:34-47), *biogencisse-ibi-hitschi*,

among the Uainuma (von Martius 1867:251), *galoarí jumana* among the Ximana (von Martius 1867:251), and *apurirá* or *kanduzirú* among the Ipurina (Nimuedajú 1955:193).

So far we can tentatively conclude that Orion seems to be involved in at least three levels of the Arawak cosmological structure. In the first level, Orion is seen dealing with hunting and with the handling of relationships in the sociological network. In the particular case of Orion's cycle, the bad relationships with in-laws lead to cannibalism, or inversely, good relations with animals lead to heavenly exile. The first misunderstanding turns cultural relationships (differentiated relationships) back to natural relationships (undifferentiated ones). The second misunderstanding transforms natural relationships (hunter-game) into supernatural ones (the sharing of a common cycle but in the sky). In this sense, we would say that Orion's myth deals with both how to handle in-laws and how to handle game.

In the second level, Orion is involved in the ordering of the seasons and it serves as a counterpoint to the Pleiades, their solstitial azimuths indicating the passing of the year. The rainy and dry seasons are locally determined in the Amazonian-Guiana region; but in almost all cases Orion, the Pleiades, and Scorpius are observed in connection with the onset or ending of the seasons. Taking this into account, we could further elaborate upon the system described by Lévi-Strauss (1964:203-288). Lévi-Strauss interprets the Pleiades as the announcer of the change of seasons, but this fact alone causes considerable problems because the Pleiades' role (or that of any constellation in so far as it is related to the beginnings or ending of the seasons) must be locally matched because the seasonal cycle depends on the latitude. If the Pleiades' heliacal/cosmic rising or setting marks the beginning of the year, then it is the heliacal rising of Scorpio or of Orion that takes over the task of announcing the seasons. It is this kind of dialectic which in turn makes the myth translatable into astronomical terms (Jara 1990; Magaña 1984a, 1988).

A third level seems to be literally superimposed upon the second one and it is also used similarly in the Guianas where the Arawak

alternative name for Orion is the "turtle nest." It seems that the native ordering of the night sky is also a means by which to convey zoological information and that asterisms are used as a kind of mnemonic device (Butt-Colson and Armellada 1989; Jara 1990; Magaña and Jara 1982).

Among the Siusi, Orion is connected with the fishing season. It is interesting that they do not use this constellation to designate any group among their neighbors. Again the meaning of this remains obscure because of the lack of details in the available data.

Scorpio

This constellation bears the name of the water boa (*Eunectes murinus*) among almost all the Arawak and non-Arawak groups in the North-Amazonian Guianan region. In the Guianas the heliacal rising of *kamudi*, the boa, or *warubusi*, the water boa, announces the December rains (Brett 1868:107-108; Goeje 1928:261; Roth 1925:261). The constellation is formed by the lower part of Scorpio, Antares included, and parts of Ophiuchus. Antares is the boa's eye (Goeje 1943:119; Taylor 1946:218-219).

Among the Wapisiana, the December-January rains are announced by *kwarar*, the mythical boa, corresponding entirely with the stars of Scorpio. Antares is a red macaw, *oi*, swallowed by the snake. This macaw gives its name in this season *oidum*; its setting in the evening announces the end of the rains, this passing moment being called *oitteppeite* (Farabee 1918:102).

The Palicur know a constellation representing a resting and rolled-up snake. It is formed by parts of Scorpio and of Sagittarius (Goeje 1943:118). Antares, according to Von Martius, represents an *acoure*, "agouti," in the boa's belly (1867:324). It is also called the father of the rains (Goeje 1943:119; Lévi-Strauss 1964:236).

The Siusi call the celestial boa *kéitapana*; Antares is its prey in its belly (Koch-Grünberg 1905:55-56, 1910:204). The Tariana call it *pinon*, the snake-boy whose body is covered with stars. The Tariana

consider themselves to be descendants of the union of the sun and the big mythic serpent (Goeje 1943:119). Among the Gogjiro, Antares is associated with the winds and it is called Pamü (Perrin 1989:147).

As far as the available data indicate, the boa constellation, corresponding or not to Scorpio, does not occur south of the Amazon River. Among the Wayana, Caribs of the interior of Surinam, *ekëuihku*, the anaconda, corresponds to parts of Hercules and Corona Borealis, or to Ophiuchus (Magaña 1987, 1988). Among the Tareno, Caribs of the Tapanahony River, the anaconda *ekëuime* corresponds to parts of Corona Borealis, Scorpio, Libra, and Serpens (Magaña 1987). To the South of the Amazon, Scorpio is associated among the Toba and Vilela, Guaraní groups of the Chaco, with the mythic *thea* and/or the *ara* (red macaw) (Magaña 1984b:204-206). Among the Campa, Antares is called *kira(ha)kiri*, a word used to describe some ailment or a red inflammation of the eyes (Weiss 1975:270).

In terms of mythic semantics it seems that among the Lokono as well as among the Palikur and Wapishana, the boa constellation has two functions. The first is apparent in the Carib version of the Jurupari myth. The boa here went up into the sky to escape from its mother's relatives. The second one is connected with some variants of the cycle of the twins. Here the boa went up into the sky after the twins to eat them. The sun itself, father of the twins, ordered the boa to carry out this task. The first boa is explicitly associated with the short rainy season which is announced by the heliacal rising of Scorpio. The second boa is apparently less fixed and, consequently, its astronomical translation depends more upon the rhetorical and dramatic emphasis put by the narrator on this episode than upon actual observation. The upper part of Scorpio, its crown, is called *kasorokuya*, "the four eyed fish" (*Anableps anableps*), by the Lokono (Goeje 1928:255). The Caribs of the Coast of Surinam see this fish, *kutai*, in the lower part of Scorpio (Ahlbrinck 1931:257, 440, 442; Magaña and Jara 1982:116). This seems to be a superimposition of codes, for while the four-eyed fish is considered to be a poor meal, its appearance on the shores indicates the abundance on the coast of the sucker-catfish, a bigger and tastier fish. The Kalina, Caribs of the

Guianan coast, have an alternative name for the upper part of Scorpio, the catfish (Ahlbrinck 1931:257). The time or position of the asterisms that indicates the onset of the catfish season is, however, uncertain. Another identification of the four-eyed fish puts it in a different code; it corresponds to Sagitta and it is followed by a kingfisher Dolphinius (Magaña and Jara 1982).

Hyades

In the Hyades, the Lokono of the Guianas see a tapir's jaw, *kamatalala* (Goeje 1928:255; Penard and Penard 1907, I:105). The same constellation and motif is found among the Wapishana who call them *kuduiwei* (Farabee 1918:112). The jaw of the tapir is associated with Mabekle or Baukur, the one-legged husband or hunter. Among the Wapishana, the heliacal rising of the Hyades announces the season of the floods or hunting season, when the animals are driven out of the bushes by the river into higher lands where they are an easy prey for the hunters (Farabee 1918:102).

According to Weiss (1975:281), the Campa call the Hyades the Bull-head adding that this is probably a European transference. Roe (1982) has recorded a constellation representing a cayman jaw that corresponds to the Hyades among the Shipibo, a non-Arawak group of the Montaña area. He suggests that the semantic function of the tapir and the cayman are interchangeable due to a series of correspondences in their habitat and behavior that put them in a suitable place to be the natural lovers. This could explain the astronomical transformation as well. The Campa, however, choose to see there a bull's head and have not followed their neighbors' representation. It may be that cattle have taken the place of the biggest game, which may, in turn, indicate that their astronomy still bears much of the Maipuran tradition.

Sirius and Procyon

In the Guianas, Arawaks and Caribs share the same name for the dog-star, *malirubana* (Goeje 1939:54; Penard and Penard 1908, II: 61). Farabee recorded that the Wapishana observed the heliacal rising

of Sirius as a signal to begin cutting the tall trees in the newly opened clearings (1918:33).

On the Islands, the Caribs and Arawaks called Procyon *malirubana*, "the other *malirubana*," and it was associated with the hurricanes (Taylor 1946:217). Although there is some evidence of the importance of both these stars among the Amazonian tribes, it is very difficult at this stage to assess their mythical importance or their value in origin myths. In the Rio Negro area, the Tukano and probably the Arawaks of the zone, associate these stars with Orion, the fish-trap. The bright stars nearby, i.e., Sirius, Procyon, Castor, Rigel, and Aldebaran are otters (Koch-Grünberg 1905:61).

The Arawaks and Kalinas of the Guianan coast observe the heliacal rising of *malirubana* (*ombatapo*) to mark the beginning of the fishing season. The origin myth tells that a mother-in-law was eaten by the fish when she was stealing the son's-in-law fish-trap. Her head went up into the sky and became a constellation. She causes the lowering of the level of the waters, thus allowing the people to fish with poison in the creeks (Goeje 1939:54; Magaña and Jara 1982: 116-117; Penard and Penard 1908, II:61).

Pegasus (the Square of Pegasus)

Pegasus corresponds to the wooden rack (barbecue) of Mabekele in the Guianas (Roth 1915:261). The Wapisiana call it *dipeli*, "the barbecue of Baukur" (Farabee 1918:104). Among the Mehinaku, Arawaks of the Xingú area, Pegasus is called *amairi*, "the manioc spirit." Its heliacal rising at dawn in February is greeted by the chief who urges the villagers to honor their ancestors and to take care of the gardens (Gregor 1977:81).

Ursa Major

In the Guianas the Great Bear is called "the heron star-spirit in its canoe," *amalakaya* (Goeje 1928:255, 1939:54). On the Caribbean Islands this constellation was called *lukuni-ya* (Arawak word) by the women and *sawaku* or *jabura* (Carib term) by the men (Taylor

1946:217). Breton (1892) identified the seven main stars of Ursa Major as corresponding to the canoe; the heron was formed by a triangle of fainter stars nearby (Taylor 1946:217). The heliacal setting of Ursa Major announced in the Caribbean Islands the end of the rains (Taylor 1946:217).

The Goajiro of Northern Colombia call the Ursa Major *iwa*, "year," according to Hildebrandt (1963:142), but there is evidence to indicate that this is probably a faulty identification. According to the data gathered by other ethnographers in this zone, *iwa* corresponds to the Pleiades.

In the Chaco area the Tereno and the Guana observe a ritual that takes place when Ursa Major is just above the eastern horizon at dusk. All men, women, and children gather in the central plaza of the village and sing and dance in circles, addressing the constellation with prayers. A similar ceremony takes place at the New Moon and when the Moon sets on the western horizon. Another occasion for such ritual behavior takes place at midnight when the people address some spot in the zenithal area (Boggiani 1945:261; Charlevoix 1761, I:74). Although such ceremonies took place quite often, Boggiani does not mention the constellations that are overhead at those moments nor does he mention whether these ceremonies took place the whole year round or at a given period of the year. Maybury-Lewis (1965) reports a similar rite among the Gê. Among the neighboring Guaycurus, the heliacal rising of the Pleiades initiated a long period of ritual festivities involving a mock fight between men and women (Charlevoix 1761, I:73).

Southern Cross α and β Centaurus

In the Guianas, the Southern Cross is called *hiisi*, the curassow bird (*Crax alector*); α and β Centaurus are a man and his wife or helper pursuing the bird (Alvarado 1956:289; Brett 1868:190; Farabee 1918:34; Goeje 1928:201; Penard and Penard 1907, I:104; Roth 1915:261). The four stars of the Cross form the bird. The heliacal rising at sunrise of *hiisikuya* marks the beginning of the bird's mating

season; at this time, the people can hear its moaning just before daybreak (Farabee 1918:102; Goeje 1928:201).

The Wapisiana used to say that maize had to be harvested and put to dry before the rising (heliacal at dawn) of *hisi*. This had to be done in the first week of October to allow the maize enough time before the rains of December (Farabee 1918:102).

In the Xingú area this constellation represents the curassow bird and a trap; the Cross is the mutum and Centaurus, the sticks of the trap. The Xinguans add to this group a not-yet-identified bright star in the Milky Way representing a young man contemplating the scene (von den Steinen 1897:315).

The Ipurina call the Cross *kazeri*, the same bird as above (Ehrenreich 1891:72). The Baniwa call the Cross by the name of *paraiman* (meaning uncertain) (Grasserie 1892:19). The Palikur call it *teyébani*: and Centauri, *tekempen* (meaning uncertain) (von Martius 1867:324).

In the Chaco area and Southern Mato Grosso, the Cross becomes a rhea and Centaurus its hunters. However, among the Mbya and the Arawaks living among them, the Cross is a one-legged ancestor hunting the mythical rhea and Centaurus is the eyes of the bird whose body is formed by a large black spot in the Milky Way (Ribeiro 1980:50). For the astronomies of the Chaco groups, see Lehmann Nitsche 1923, 1924-1927, 1923-1925b, 1924-1925 (respectively, the astronomy of the Mataco, Mocovi, Taba, and Vilela).

Aries

Aries is known as the capybara, *tadaii*, among the Central Arawaks. Its heliacal rising at dawn announces the time for planting maize in the dry season. During this season, the capybara is an easy prey because it leaves the bushes to feed on the savanna grass (Farabee 1918:101).

Among the coastal Arawaks the capybara is also known as a constellation but it has not yet been identified. The capybara, *kibiole*

or *kabiwapa*, is followed by *kamudi*, the mythic snake. In the origin myth that connects these two asterisms, *kamudi* corresponds to parts of Perseus (Goeje 1943:119; Penard and Penard 1908, II:58; Roth 1915:261;). The identification of the capybara constellation could contribute to untangling the problems that arise from the abundance of boa constellations among the coastal Arawaks and Caribs (see under Scorpio).

Altair

Among the Central Arawaks, Aquila represents three men crossing the River of the Death, the Milky Way. Aquila has fallen into the river and the others are trying to rescue him because he cannot swim (Farabee 1918:102). The Island Caribs (and thus, also, their Arawak women) looked for Altair as the announcer of the short rainy season in December (Taylor 1946:219).

Spica

The Central Arawaks call it *marikmanka*, the corn planter (Farabee 1918:102).

Leo, Corona Borealis, Boötes

The Siusi of Rio Negro call *dzaza*, crab, some stars west of Leo and *mamneddzaka*, another crab, a larger constellation formed by and of both Corona Borealis and Boötes (Koch-Grünberg 1910:204). A crab constellation made up of some stars of Leo is known by their Tukano neighbors (Koch-Grünberg 1905:60; Da Silva 1977:232). *Osero* is the name given by the Campa to a celestial crab, but it has not yet been identified (Weiss 1975:270).

The coastal Arawaks of Guiana also have a crab constellation, but it remains unidentified. It announces the time to catch river crabs in the mud banks, but whether it is observed at sunrise or sunset, or at its heliacal or cosmic setting or rising, remains uncertain (Magaña and Jara 1982; Penard and Penard 1907, I:104). The Wayana, Caribs of the Guianas, recognize a crab constellation formed by the main

stars of Corona Australis and some stars of Sagittarius (Magaña 1987).

Leo, Cancer, Gemini

Wakarasab is the great egret that can be seen flying with wide-spread wings after Baukur, Orion. The flight of this bird is held responsible for thunder and winds (Farabee 1918:102). The celestial egret has not yet been identified. Still, this scene seems to have been represented in rock art in two different sites, both located in Central Guiana, one in the Crab Falls in the Upper Essequibo, the second one in a rock formation about twenty miles south of the lower course of the Orinoco river in Venezuela. The engraving was found at a place called *kassikaityu*, that is frequented nowadays by the Central Arawaks and the Wai-Wai and is used as a fishing area. Matching the data of two archaeological survey in the zone, the engravings may have been made around 1400 A.D. (Williams 1979:127). The figure represents a rodent (capybara or agouti), (center left), a large bird with outspread wings at its right hand, a large long spot crossing the picture (left to right), and in the left edge the figure of a snake while at the right edge the figure of a crab is drawn. Looking at the engraving as if were an inverted image of the sky, we can try a gross identification of the stars in question. First, the large elongated spot could be the Milky Way, "the river of the death", the rodent figure possibly corresponds to *tadaiti* (Aries, see above), the snake on the left could correspond to the stars of Perseus *kamudi* (see above under Scorpio); the crab at the opposite end might be Cancer, also identified as such among the Macusi and other Central Carib groups; the mythic egret could thus correspond roughly to the position of Leo and Gemini in the sky. The second case will be examined in the Final Remarks because it implies a whole sky chart besides the egret constellation.

Eridanus

In the Río Negro area this constellation is said to represent a dance instrument, *kakudzulá* in Siusi. This object is the only case that

I found in the data concerning Arawak asterisms where a ritual instrument is represented (Koch-Grünberg 1905:60-61, 1910:204).

Cygnus

Deneb was identified as a red-breasted king fisher among the Central Arawaks. Sileli flies over the Mawakumawea River, the Milky Way (Farabee 1918:102).

The Milky Way

In the Guianas the Milky Way is called "the path of the clay-fetchers," *wai é onnakici abonaha*, and also "the tapir's way" (Brett 1968:107-108; Goeje 1928:255, 1943:112; Roth 1915:260).

Among the Central Arawaks, it is named after the Amazon River and is conceptualized as the "river of death" (Farabee 1918:102). The theme of the river of death associated with the Milky Way is interesting in a comparative perspective, because the groups of the Vaupés and Río Negro believe that the river of death flows underground; the symbolic meaning of this river among the Barasana has been extensively analyzed by C. Hugh-Jones (1979:231-274).

The Ipurina call it *birikinami* (Nimuendajú 1955:181-183). The Peressi used to call it "the path covered by *kutá* fruits," the tapir's food (Metrax 1942:170). The dark spots in Milky Way are also conceptualized by some Arawaks south of the Amazon River. The Mehinaku, as well as other Xinguan groups, see in the dark-spots near Scorpio and Aquila a jaguar hunting a tapir or an anteater (Gregor 1977:81).

The Campa call the Milky Way "the great tambo," (meeting place), *antiaro tambo* or *iyamoré henokasati*, which means "the people of the sky are closing the river branch [to fish]" (Weiss 1975:270). The dark spot near Antares is called *icakamento kirakiri*, "digging stick," a tool used in the planting of maize; the overhead position of the spot at nightfall marks the time to begin the planting.

The Magellanic Clouds are also conceptualized by the Campa; one of them is called *sorôni*, the sloth (Weiss 1975:270).

Other stars and constellations known by the Arawaks but not yet identified are listed below.

Awarakuya

The constellation of the *awara* palm (*Astrocaryum segregatum*). *Awara* is the local name of this palm in the Guianas. The heliacal rising at sunrise of the constellation is said to announce the short dry season from mid January to March. Its rising should coincide with the ripening of the palm's fruits. The constellation is accompanied by a *tukuleru* (agouti) eating the fallen fruits on the ground (Penard and Penard 1907, I:103). The Kalina Caribs of the coast share this constellation with the Arawaks. They have given two identifications of it, one formed by Coma Berenices and Boötes, the other formed by parts of Aquarius and Aquila (Magaña and Jara 1982).

Hikulikuya

The constellation of the land turtle (*Testudo tabulata*) rises with the sun when the swamps are flooded and the turtles venture into the open savannas in search of dry places (Penard and Penard 1907, I:104). The Campa also know a land turtle constellation, *semperi* (Weiss 1975:270).

Ivakuya

The constellation of the muscovy duck (*Cairina moschata*) among the Lokono (Penard and Penard 1907, I:104).

Inaro

The constellation of the sting-ray is known by the Campa (Weiss 1975:270). This species has a prominent place in the mythology of the Amazonian and Guianan Arawaks. Among the Lokono and Wapisiana, as well as among the Arekuna (Caribs of the Rio Branco),

the sting-ray is held responsible for the origin of the poisonous twigs used in fishing (Brett 1880:72-73; Lévi-Strauss 1964:266-268). In Guiana, however, it is only among the Wayana (Caribs) where a constellation of the ray is known, formed by Corona Borealis and parts of Boötes and Draco (Magaña 1987). The constellation of the sting-ray is known among the Shipibo and has been identified by Roe (1983) as corresponding to some stars of Lupus.

Kabadarukuya

This is the jaguar star among the Lokono (Penard and Penard 1907, II:104). The Siusi also have a jaguar constellation. Among the Tukano this corresponds to Cetus (Koch-Grünberg 1905:61). The Pareisi also know a jaguar constellation in which the jaguar is seen hunting or eating a deer (Métraux 1942:170).

Katari

This is the constellation of the *anhinga* bird (a marsh bird) among the Campa (Weiss 1975:270).

Kito

This is the constellation of the shrimp among the Campa (Weiss 1975:270).

Kulerukuya

Among the Lokono, Kulerukuya is the macaw star. It has not yet been identified but the sources indicate that it should rise at the end of February in the morning. This announces the time to take the newborn macaws from their nests. The birds are kept as pets and for their feathers which are used in headdresses (Penard and Penard 1907, I:104). The Wapisiana identify a macaw star that corresponds to Antares; but because it appears at sunrise in December, it is probably not Kulerukuya.

This is the constellation of pitiri, a riverine bird, among the Campa (Weiss 1975:270).

Tukuleru

This is the constellation of the agouti in the Guianas (see under Awara).

Walimedukeya and Hawkuya

This is the constellation of the sloth among the Lokono. Apparently, it rises with the sun during the dry season when the sloth "moves" (Penard and Penard 1907, 1:104).

Woyanakuya

The star of the iguana rises with the sun in August when the iguana nest in the savanna sand banks, according to the prevalent theory among the Lokono and the Kalina of the Guianas. The constellation of the Iguana is also recorded among the Wayana and the Tareno of Surinam. For these groups, it is formed by Corona Australis, Delphinus, and Sagitta (Magaña 1987).

Final Remarks

The catalog of asterisms presented above contains fifty-seven asterisms, thirty of them positively identified. Most of the asterisms (thirty) have been recorded among the Arawak groups of the Guianas, especially among the Lokono and the Wapisiana; fourteen asterisms were recorded among the Arawaks of the Rio Negro; seven among the Siusi; and the rest are drawn from other areas. North Amazonia seems to be over-represented. Astronomical data recorded among Arawaks south of the Amazon River is scarce.

From the ethnographic sources, it becomes clear that the system described by Lévi-Strauss, when studying the myths of origin of the stars, is the most prominent feature of the astronomy of the Guianas. This is the combination of the rising and/or setting of the Pleiades (the stars of the year) with the rising and/or setting of Orion, and/or Scorpio, observed heliacally or cosmically. The combination is needed because the onset of the seasons varies locally. It is also very characteristic of the Guiana mythology to use the model based on the behavior of the celestial bodies, mainly the stars and constellations, to convey both the underlying principles of cosmology and to express the structural problems that arise in social relationships (Jara and Magaña 1983; Kloos 1971:226-233; Lévi-Strauss 1964:217-237). But, as Magaña has pointed out, the use of the Pleiades as announcer of the seasons is only one aspect of the astronomical system of the Indians of the Guianas. He connects the observation of the Pleiades and Orion among the Caribs with the observation of the solstices and of the zenithal passage of the sun. In this perspective the role of announcer of the seasons played by the Pleiades and Orion acquires a functional rather than structural character. This marks the astronomical system out as a field on its own in the cosmology of the Guianas (Magaña 1984a).

The interest that the people of the Guianas have had in the stars and constellations and in the relationships among them is further illustrated by an astronomical chart found by Olsen in Venezuela. Olsen describes the site as being in use for at least 5000 years because of the engraving and painting of figures. The most ancient users, as well as the present ones, seem to have been Arawaks. Although archaeological evidence is lacking for the long period between the ancient and modern people, it is not impossible that the Arawaks were the engravers of the celestial chart in the place. Olsen has matched the figures found on a ledge, consisting of the drawings and a series of dots and lines, with the Standard Constellation Chart and came to the conclusion that this was a representation of the sky section that includes the Pleiades, Hyades, Orion (its Belt), Gemini, and Sirius. There were also lines underneath the Pleiades and the Belt of Orion that suggest that the engraver was aware of the solstitial and equino-

742
tial phenomena and had related these to the azimuth of these constellations.

The figural motifs on the chart are the more suggestive because they represent a big bird with outspread wings and a man standing upright with a spear-like object in his right hand. The figures could represent, in my opinion, two outstanding mythical characters known among the Central Arawaks: the egret and the raging hero (Olsen 1979; see above under Leo, Cancer, Gemini, and Orion).

The chart described by Olsen, moreover, seems also to deal with the problems which arise from the simultaneous counting of the lunar and the solar year. There is a figure that brings the Hyades into connection with the full moon, but Olsen did not elaborate on this. As has been said, it is impossible to ascertain whether or not it was Arawaks who engraved the rocks, and the age of the engravings is still more difficult to discover. The only thing known for sure is that the ledge where the chart is drawn is a concealed place and that the Arawaks today were unaware of its existence.

In recent years fieldwork on the astronomy of the Caribs of the Guianan coast has yielded valuable information. This kind of work remains to be done among the Arawaks in the same region. They have conserved their lore to a larger degree than in other countries, but because their acculturation process is fast, the urgency of such work is therefore dramatic. Additional fieldwork is necessary for researchers to reach more conclusive hypotheses about the importance of Arawak astronomy in the lowlands. Very generally and tentatively, I suggest that a confluence of technological (horticultural) and sociological factors: strict sexual division of labor in subsistence activities combined with a rather loose social structure, as Rivière describes the *Arawaks and Caribs in the Guianas* (1984); the explicit analogy between the behavior of the main constellations along the yearly cycle; and the behavior of the recognized social categories (man/women, kin/in-laws) which can be found in the myths of origin of the constellations, that make the system appear the more coherent in all readings in the Guiana region (Magaña 1984a, 1988). This confluence is more likely to have happened among the Arawaks.

143
They were, on the other hand, the ones who spread manioc in the lowlands and probably the association of the Pleiades with the onset of the horticultural cycle.

Finally, in what concerns the acculturation of the Arawaks in the different areas of South America, I suggest the following: the blending of Arawak and Carib culture seems to express itself in more specific details in the fields of cosmology and astronomy and could have been responsible for simplifying the arrangement and interpretation of the social structures in both societies. The combination of Arawak and Tukano culture seems to be more one-sided, favoring the dominance of the Tukano over the Arawaks in terms of their cosmological notions and social arrangements. However, in terms of technological devices, such as in horticulture and astronomical knowledge linked to it, there seems to be a Tukano reinterpretation which over-complicates the situation. I suggest that astronomy in this area has gone through a similar process of incorporation such as that of the elaboration of manioc. C. Hugh-Jones makes her point when she concludes that the long and complicated process involved in the elaboration of bitter manioc among the Barasana is more a symbolic necessity than otherwise. She points out that looking to other areas such as the Guianas, where manioc has long been used, the process shortens almost six times (1979:174-192, 217-234). Reichel-Dolmatoff's analysis of the complex of the Yurupary in the Vaupes area demonstrates how the history of interethnic relationships has played a crucial role in the shaping of the myths and cosmogonic notions of the Tukano and Arawak groups involved (1989). There is, of course, more to be said and to be studied about the way in which native South American astronomy could have taken its present form. I hope this catalog will set up the basis for analysis and research in this crucial field.

Note

1. For a treatment of the mythological and the ethnohistorical component of this theme, see Reichel-Dolmatoff 1989.

I would like to thank Edmundo Magaña for his comments and valuable suggestions on previous manuscripts of this paper and Peter Mason for the English editing. The Center of Study and Documentation of Latin America made it possible for me to attend the conference on Indigenous Astronomical and Cosmological Traditions of the World, where I presented a first version of this article.

References Cited

- Ahlbrinck, William. *Encyclopaedie der Kariben. Verhandelingen der Koninklijke Akademie van Wetenschappen, Letterkunde 27*, 1931:1.
- Alvarado, L. *Datos Etnográficos de Venezuela*. Caracas: Ministerio de Educación, 1956.
- Baldus, Herbert. *Die Jaguarzwillingen. Mythen un Helbringergeschichten, Ursprungsgogen und Märchen Brasilianischer Indianer*. Kassel, 1958.
- Boggiani, G. *Os Caduveo*. Vol. XIV. Sao Paulo: Biblioteca Histórica Brasileira, 1945.
- Breton, Raimond. (1665) *Myths of the Aboriginal Indians of British Guiana*. London: William Wells Gardner, 1892.
- Brett, William Henry. Rev. *The Indian Tribes of Guiana: Their Condition and Habits*. London: Bell and Daldy, 1868.
- _____. *Legends and Myths of the Aboriginal Indians of British Guiana*. London: William Wells Gardner, 1880.
- Butt, Audrey. "The Present State of Ethnology in Latin America." *Actas y Memorias del XXXVI Congreso Internacional de Americanistas*. Sevilla 3 (1964):19-37.
- Butt-Colson, Audrey and Cesáreo de Armellada. "The Pleiades, Hyades and Orion (*Tamokan*) in the Conceptual and Ritual System of Kapon and Pemón Groups in the Guiana Highlands." *Scripta Ethnologica* 9 (1989):153-200.
- Celedón, R. *Gramática, catecismo i vocabulario de la lengua Guajira*. Paris: Editions Maisonneuve i Cie, 1878.
- Chandleess, W. "Notes of a Journey up the River Junua." *Journal of the Royal Geographical Society* 39 (1869):296-311.

- Dumont, Jean-Paul. *Under the Rainbow. Nature and Supernature among the Panare Indians*. Austin: Texas University Press, 1972.
- Ehrenreich, P. "Beiträge zur volkerkunde Brasilens." *Ver- öffentlichungen aus den Königlichen Museum für Völkerkunde* 2 (1976):1-80. Berlin.
- Farabee, William Curtis. "The Central Arawaks." 1918. *Anthropological Publications of the University Museum* 9. Philadelphia. Photomechanic reprint, The Netherlands: Anthropological Publications Oosterhout N.B., 1967.
- Gillin, J. "Tribes of the Guianas." In *Handbook of South American Indians*, 3. *Bulletin of the Bureau of American Ethnology* 143, edited by J. Steward, 799-858. Washington, DC: Smithsonian Institution, 1848.
- Goeje, C.H. de. "The Arawak Language of Guiana." *Verhandeligen der Koninklijke Akademie van Wetenschappen, Letterkunde* 28, no. 2 (1928):1-309.
- _____. "Nouvel examen des langues des Antilles avec notes sur les langues Arawak-Maipure et Caribes et vocabulaires Shebayo et Guayana (Guyane)." *Journal de la Société des Américanistes* 24 (1939):1-168.
- _____. "Philosophy, Initiation and Myths of the Indians of Guiana and Adjacent Countries." *Archives Internationales d'Ethnographie* (1943):44. Leiden.
- _____. "La Langue Manao. Famille Arawak-Maipure." *Actes du Congrès International des Américanistes* 28 (1948):157-170. Paris.
- Grasserie, R. de la. *Essai d'un vocabulaire de la langue Boniva*. Paris, 1892.
- Gregor, Thomas. *Mehinaku. The Drama of Daily Life in a Brazilian Indian Village*. Chicago: University of Chicago Press, 1977.
- Hildebrandt, Martin. *Diccionario Guajiro-Español*. Caracas, 1963.
- Holmer, N. "Goajiro (Arawak) Phonology." *International Journal of American Linguistics* 16 (1949):45-56.
- Hugh-Jones, Christine. *From the Milky River. Spatial and Temporal Processes in Northwest Amazonia*. Cambridge: Cambridge University Press, 1979.
- Hugh-Jones, Stephen. *The Palm and the Pleiades. Initiation and Cosmology in Northwest Amazonian*. Cambridge: Cambridge University Press, 1979.
- _____. "The Pleiades and Scorpio in Cosmology." *Annals of the New York Academy of Sciences* 385 (1982):183-203.
- Im Tum, Everard Ferdinand. *Among the Indians of the Guiana*. London, 1883.

Jara, Fabiola. "Nociones Astronómicas de los Turackare de Surinam." In *Scripta Ethnologica*, edited by Edmundo Magaña. Supplementa 9 (1989):201-208.

_____. "El camino del Kumu. Ecología y Ritual entre los Akuriyó de Surinam." *ISOR*. Utrecht- Holland, 1990.

Jara, Fabiola and Edmundo Magaña. "Astronomy of the Coastal Caribs of Surinam." *L'homme, revue française d'anthropologie* 23(1):111-134.

Kloos, Peter. *The Maroni River Caribs of Surinam*. Assen, The Netherlands, 1971.

Koch-Grünberg, Theodor. *Anfänge der Kunst im Urwald*. Berlin, 1905.

_____. "Spricht über die Indianerstämme am oberen Rio Negro und Yapura und ihre Sprachliche Zugehörigkeit." *Zeitschrift für Ethnologie* 38 (1906):166-205.

_____. *Zwei Jahre unter der Indianern. Reisen in Nordwest-Brasilien 1903-1905*. 2. Berlin, 1910.

_____. *Von Roraima zum Orinoco. Ergebnisse einer reise in Nordbrasilien und Venezuela in dem Jahren 1911-1913*. 3. Stuttgart, 1923.

Lehmann-Nitsche, R. "La astronomía de los Matacos." *Revista del Museo de la Plata* 27 (1923):253-266. Buenos Aires.

_____. "La astronomía de los tobas." *Revista del Museo de la Plata* 27 (1923/25):267-285; and 28:209. Buenos Aires.

_____. "La astronomía de los vilelas." *Revista del Museo de la Plata* 28 (1924/25a):210-233. Buenos Aires.

_____. "La astronomía de los chiriguano." *Revista del Museo de la Plata* 28 (1924/25b):80-102. Buenos Aires.

_____. "La astronomía de los mocovi." *Revista del Museo de la Plata* 28 (1924/27):66-79; and 30:145-159.

Lévi-Strauss, Claude. *Le Cru et le culti*. Paris: Plon, 1964.

_____. *Du miel aux cendres*. Paris: Plon 1967.

Magaña, Edmundo. "Carib Tribal Astronomy." *Social Science Information* Vol. 23, no. 2 (1984a):341-368.

_____. "Some Tupi Constellations." *Ibero-Amerikanisches Archiv*. n.f. 10, no. 2 (1984b):179-221.

_____. *Estrellas y Mitos en las Guayanas. Contribuciones al estudio de la astronomía y mitología de los Tarento, Wayana y Kalina*. Amsterdam. CEDLA/AFORIS, 1987.

_____. *Orton y la mujer Pléyades. Simbolismo astronómico de los indios kalina de Surinam*. Dordrecht, Holland: Centro de Estudios y Documentación Latinoamericanos/ Foris, 1988.

_____. "Nociones astronómicas y cosmológicas de los Trios de Surinam." *Scripta Ethnologica Supplementa* (1989):209-245.

Magaña, Edmundo and Fabiola Jara. "The Carib Sky." *Journal de la Société des Américanistes* 68 (1982):105-132.

_____. "Star Myths of the Kalina (Carib) Indians of Surinam." *Latin American Indian Literatures* 7, no. 1 (1983):20-37.

Martius, Carl Friederich Phil. von. *Beiträge zur Ethnographie und Sprachenkunde Amerika's zumal Brasilens*. 2 vols. Leipzig, 1867.

Mason, J. "The Languages of South American Indians." In *Handbook of South American Indians*, 6. *Bulletin of the Bureau of American Ethnology* 143, edited by J. Steward, 157-317. Washington DC: Smithsonian Institution, 1950.

Maybury-Lewis, David. *The Savage and the Innocent*. Boston: Beacon Press, 1965.

Métraux, Alfred. "The Native Tribes of Eastern Bolivia and Western Mato Grosso." In the *Handbook of South American Indians* 3, *Bulletin of the Bureau of American Ethnology* 143, edited by J. Steward, 349-361. Washington, DC: Smithsonian Institution, 1942.

_____. "The Native Tribes of Eastern Bolivia and Western Mato Grosso." *Bulletin of the Bureau of American Ethnology* 134. Washington, DC: Smithsonian Institution, 1948a.

_____. "Tribes of Eastern Bolivia and the Madeira Headwaters." In *Handbook of South American Indians* 3, *Bulletin of the Bureau of American Ethnology* 134, edited by J. Steward, 349-465. Washington, DC: Smithsonian Institution, 1948b.

_____. "Tribes of the Juna-Purus Basin." In *Handbook of South American Indians*, 3, *Bulletin of the Bureau of American Ethnology* 134, edited by J. Steward, 657-685. Washington, DC: Smithsonian Institution, 1948c.

_____. "Tribes of the Middle and Upper Amazon River." In *Handbook of South American Indians* 3, *Bulletin of the Bureau of American Ethnology* 134, edited by J. Steward, 687-712. Washington DC: Smithsonian Institution, 1948d.

Métraux, Alfred and Julian Steward. "Tribes of the Peruvian and Ecuadorian Montaña." In *Handbook of South American Indians* 3, *Bulletin of the Bureau of American Ethnology* 134, edited by J. Steward, 535-557. Washington DC: Smithsonian Institution, 1948.

Nimwendajü, Curt. "The Turiwara." In *Handbook of South American Indians* 3, *Bulletin of the Bureau of American Ethnology* 134, edited by J. Steward, 193-199. Washington, DC: Smithsonian Institution, 1948.

_____. "Reconhecimento dos rios Içana, Ayari, e Uaupetés. Março a julho de 1927. Aparentamentos linguísticos." *Journal de la Société des Américanistes* 39 (1950):125-182; 44 (1955):149-178.

_____. "Vocabulários Makusi, Wapicána, Ipurina e Kapisana." *Journal de la Société des Américanistes* 44 (1955):179-197.

148

Noble, K.G. *Proto-Arawakan and Its Descendants*. The Hague: Mouton, 1965.

Olsen, Fred. "The Arawaks: Their Art, Religion and Science." In *Proceedings of the International Congress for the Study of the Pre-Columbian Cultures of the Lesser Antilles*. Tempe, Arizona, 1979.

Overing, Kaplan. "Dualism As An Expression of Difference or Danger." In *Marriage Practices in Lowland South America*, edited by K. M. Keninger, 127-135. Chicago: University of Illinois Press, 1984.

Penard, A.P. and F.P. Penard. *De Menschhetende Aanbidders der Zonnenslang*. 3 vols. Paramaribo, 1907-1908.

Perrin, Michel. "Astronomie Guajiro." In *Scripta Ethnologica*, edited by Edmundo Magaña. Supplementa 9 (1989):143-152.

Quandt, Christlieb. *Nachricht von Suriname und seinen Einwohnern, sonderlich den Arawacken, Warranen und Kariben*. Götting, 1807.

Reichel-Dolmatoff, Gerardo. "The Loom of Life: A Kogi Principle of Integration." *Journal of Latin American Lore* 4, no. 1 (1978):5-27.

_____. "Desana Shamans' Rock Crystals and the Hexagonal Universe." *Journal of Latin American Lore* 5 (1):117-128.

_____. "Astronomical Models of Social Behavior Among Some Indians of Colombia." *Annals of the New York Academy of Sciences* 385 (1982):165-181.

_____. "Biological and Social Aspects of the Yunupat Complex of the Colombian Vaupés Territory." *Journal of Latin American Lore* 15, no. 1 (1989):95-136.

Ribeiro, Darcy. *Kadiwéu. Ensaios etnológicos sobre o saber o azar e a beleza*. Petropolis, Brazil, 1980.

Rivière, Peter. *Individual and Society in Guiana. A Comparative Study of Amerindian Social Organization*. Cambridge: Cambridge University Press, 1984.

Rivet, Paul and Reinburg, P. "Les Indiens Marawan." *Journal de la Société des Américanistes* 23 (1921):103-118.

Roe, Peter. *The Cosmic Zygote: Cosmology in the Amazon Basin*. New Brunswick: Rutgers University Press, 1982.

_____. "Mythic Substitution and the Stars Aspects of Shipibo and Quechua Einoastronomy Compared." Paper read at the Conference on Ethnoastronomy: Indigenous Astronomical and Cosmological Traditions of the World, 5-9 September. Washington, DC: Smithsonian Institution and University of Maryland, 1983.

149

Roth, Walter E., M.D. "An Inquiry Into the Animism and Folklore of the Guiana Indians." *30th Annual Report of the Bureau of American Ethnology*, pp. 103-386. Washington, DC: Smithsonian Institution, 1915.

_____. "An Introductory Study of the Arts, Crafts and Customs of the Guiana Indians." *38th Annual Report of the Bureau of American Ethnology*, pp. 25-745. Washington DC: Smithsonian Institution.

Sanders, Andrew. "Family Structure and Domestic Organization among Coastal Amerindians in Guyana." *Social and Economic Studies* 22, no. 1 (1973) 440-478.

Schweiring, Karl. "Arawak, Carib, Gê, Tupi: Cultural Adaptation and Culture History in the Tropical Forest, South America." XXXIX Congreso Internacional de Americanistas, 4 (1972):39-57. Lima.

Silva da, A. *A civilização indígena do Uaupés*. Roma, 1977.

Steinen von den, Karl. *Unter den Naturvölkern Zentral-Brasiliens*. Berlin, 1987.

Taylor, Daryl. "Notes on the Star Lore of the Caribes." *American Anthropologist* 48 (1946):215-222.

_____. "Loan Lords in Central American Caribs." *Word Journal of the Linguistic Circle of New York* 4, no. 3 (1948):18, 195.

Weiss, Gerard. "Campa Cosmology: The World of a Forest Tribe in South America." *Anthropological Papers of the American Museum of Natural History* 52. New York, 1975.

Wilbert, Johannes. "Warao Cosmology and Yekuana Roundhouse Symbolism." *Journal of Latin American Lore* 7, no. 1 (1981):27-72.

Williams, Denis. "Pre-ceramic Fishtraps on the Upper Essequibo: Report on a Survey of Unusual Petroglyphs on the Upper Essequibo and Kassikaitiyu Rivers." *Journal of Archaeology and Anthropology* 2, no. 2 (1979):125-140. Georgetown, Guyana.

Winth, M. "A mitologia dos Vapídiara do Brasil." *Sociologia* 5, no. 3 (1943):164-199.